

# Tendonitis and Tendon Rupture in Low-Profile Dorsal versus Volar Plating for Distal Radius Fractures: A Systematic Review and Meta-Analysis

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## INTRODUCTION:

Dorsal plating of distal radius fractures has historically been associated with high rates of hardware removal, tendonitis, and tendon rupture. Much of this original research was performed using traditional 2.5mm thick distal radius plates. Modern dorsal plates are thinner (1.2mm-1.5mm thick) with contoured edges and locking options for decreased screw prominence. In this systematic review and meta-analysis we examine whether these modern dorsal plates still have higher rates of tendon complications than volar locking plates.

## METHODS:

We search Ovid MEDLINE, Web of Science, and EMBASE for all published literature describing tendon complications in association with plating of distal radius fractures. Inclusion criteria included any retrospective or prospective study of low-profile dorsal plates that included data on tendon complications. Exclusion criteria included: failure to use only low-profile dorsal plates or failure to specify plate characteristics; no reporting of tendon complications; use of 2 or more plates or fixation strategies; or use of volar plating only. Studies that included both low-profile dorsal and volar plating arms were also included in a meta-analysis. Every study was screened by at least two independent researchers. All studies were assessed for quality and risk of bias using MINOR's criteria. Results were synthesized and analyzed.

## RESULTS:

Nine studies were selected for inclusion. All 9 studies were retrospective cohorts with a total of 456 low-profile dorsal plates. Five studies were included in the meta-analysis with a total of 806 subjects; 584 received volar plates and 222 received low-profile dorsal plates. Minimum average follow-up was 5 months. Of all patients receiving low-profile dorsal plates, 7% experienced tendonitis, 0.7% had a tendon rupture, and 9.6% underwent hardware removal. Meta-analysis showed no significant difference in rates of tendonitis (4 studies,  $Z=0.79$ ,  $P=0.43$ ) or tendon rupture (5 studies,  $Z=0.59$ ,  $P=0.56$ ).

## DISCUSSION AND CONCLUSION:

The body of literature comparing modern dorsal plates to volar options is sparse. Only 9 studies were identified for inclusion (5 for the meta-analysis), all of level III evidence (retrospective cohort). To our knowledge, however, this review provides the largest comparison of modern dorsal and volar distal radius plates to date. Our results do not demonstrate increased risk of tendon complications in patients who underwent dorsal plating of distal radius fractures. Certain fracture patterns or soft tissue envelopes are more amenable to dorsal plating than volar plating. Many orthopaedic surgeons are hesitant to implant dorsal plates, or routinely schedule hardware removal even in the absence of symptoms which contributes to rising healthcare costs. Our study sets a precedent for more routine use of dorsal plating. Further research, including randomized or non-randomized prospective cohorts would contribute substantially to our knowledge.

Figure 1. Meta-analysis of rates of tendon rupture across 5 studies. Note that Chou 2011 and Kumar 2010 are not included in the forest as they both had an event rate of zero. The statistically significant difference was found in volar versus dorsal plating (OR 0.55, 95% CI 0.33).

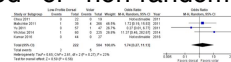


Figure 2. Meta-analysis of rates of tendonitis across 4 studies. No statistically significant difference was found in volar versus dorsal plating (OR 0.79, 95% CI 0.33).

